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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,432	09/29/2005	Kenichi Machida	053087	2955
38834 7590 05/25/2007 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			EXAMINER BURKHART, ELIZABETH A	
			ART UNIT 1762	PAPER NUMBER
			MAIL DATE 05/25/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/551,432	<b>Applicant(s)</b> MACHIDA ET AL.	
	<b>Examiner</b> Elizabeth Burkhardt	<b>Art Unit</b> 1762	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 April 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3,4 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3,4 and 8-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/23/07</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Claims 3, 4, and 8-16 are pending in the application. Amended claims 3, 4, and 8-10 and new claims 15 and 16 are noted. The amendment dated 23 April 2007 has been entered and carefully considered. In view of said amendment, the objection to the specification has been withdrawn.

#### ***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 3, 4, and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirozawa and Kaino in view of Kadokura and Nishiuchi.

Hirozawa et al. ('048) discloses a method of manufacturing a high-efficiency rare earth permanent magnet, wherein the magnet is a Nd-Fe-B system or a Pr-Fe-B system, and deterioration of magnetic properties is prevented by depositing a rare earth element such as Tb or Dy onto the previously grinded surface of said magnet by a sputtering method. Heat treatment is applied to said magnet in a vacuum after said sputtering deposition replacing a layer damaged by working with a reformed layer (Abstract). Diffusing the rare earth element has the effect of improving the magnetic characteristic (BH)<sub>max</sub> as evidenced by Kaino et al. ('303).

Kaino et al. ('303) discloses a method of depositing a rare earth element such as Tb or Dy onto a rare earth permanent magnet, wherein the magnet is a Nd-Fe-B system or a Pr-Fe-B system, by a sputtering method to avoid a decrease of the magnetic

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characteristic (BH)max. Heat treatment is performed after sputtering to diffuse the rare earth material not only on the surface of the magnet, but to the inward thereof (Abstract).

Hirozawa et al. ('048) and Kaino et al. ('303) do not disclose the shape of the magnet. Neither discloses placing said magnet on an electrode wire or in a wire basket between oppositely-disposed targets in a depressurized tank and rotating said magnet.

Kadokura et al. ('739) discloses a method for depositing a thin film onto a substrate by opposed target type sputtering to produce a uniform thin film at a high deposition rate (Col. 1, lines 19-22 and Col. 3, lines 24-27).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to incorporate opposing targets as suggested by Kadokura et al. ('739) into the sputtering processes of Hirozawa et al. ('048) and Kaino et al. ('303) in order to produce a more uniform film at a high deposition rate.

Nishiuchi et al. ('089) discloses a vapor deposition apparatus comprising a vacuum chamber, an evaporating section for evaporating material, and a holding member for rare earth permanent magnets (Col. 3, lines 12-19 and Col. 4, lines 5-7). The holding member may consist of cylindrical stainless steel mesh barrels in which the magnets may tumble (Col. 6, lines 44-50) or the holding member may be a structure which can hold hanging ring-shaped magnets (Fig. 6, Col. 10, lines 28-34). The open area of the mesh barrels depends on the size and shape of the magnets (Col. 9, lines 65-67). The vapor deposition apparatus is used to deposit a coating onto the magnets wherein the coating applied is uniform.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to use the apparatus as suggested by Nishiuchi et al. ('089) in the vapor deposition processes of Hirozawa et al. ('048) and Kaino et al. ('303) wherein the magnet to be coated is rotated by either a wire through a hole in the magnet or the magnet being tumbled in a mesh basket in order to deposit a uniform coating.

Regarding Claims 4 and 10, determining whether to diffuse the rare earth metal while depositing the coating at a high temperature or diffusing the rare earth metal by heat treatment after depositing the coating would merely constitute a design feature in which it would be obvious for one of ordinary skill to incorporate into the processes of Hirozawa et al. ('048) and Kaino et al. ('303).

Regarding Claims 11 and 13, Hirozawa et al. ('048) discloses the heat treatment to diffuse the rare earth metal after sputtering is performed in a vacuum or an inert atmosphere which would contain a concentration of impurity gases of less than 50 ppm.

Thus, claims 3, 4, and 9-14 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Hirozawa et al. ('048), Kaino et al. ('303), Kadokura et al. ('739), and Nishiuchi et al. ('089).

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirozawa and Kaino in view of Kadokura and Nishiuchi as applied above and in further view of Kamiya.

The above listed references fail to disclose using ring-like targets during the sputtering deposition process.

Kamiya ('778) discloses using oppositely-disposed ring-like targets in a sputtering process to form a high quality thin film at a high speed.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to incorporate ring-like targets as suggested by Kamiya ('778) into the processes of Hirozawa et al. ('048), Kaino et al. ('330), Kadokura et al. ('739), and Nishiuchi ('089) in order to produce a high quality thin film at high speeds.

Thus, claim 8 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Hirozawa et al. ('048), Kaino et al. ('330), Kadokura et al. ('739), Nishiuchi et al. ('089), and Kamiya ('778).

4. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirozawa and Kaino in view of Kadokura and Nishiuchi as applied above and in further view of Makita.

The above listed references fail to disclose the surface to volume ratio of the magnet.

Makita et al. ('511) discloses a microminiature rare earth permanent magnet coated with an anticorrosion covering wherein the surface area of  $S \text{ mm}^2$  and the volume of  $V \text{ mm}^3$  are variable and the surface to volume ratio ( $S/V$ ) ranges from  $1\text{-}50 \text{ mm}^{-1}$  [0014] in order to prevent the degradation of the magnetic properties of said magnet [0001]. In a specific example,  $S/V$  is  $2 \text{ mm}^{-1}$  and the volume is  $27 \text{ mm}^3$  [0045].

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to coat the small magnet of Makita et al. ('511) with a rare earth

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element as suggested by Hirozawa et al. ('048) and Kaino et al. ('303) in order to better prevent the degradation of the magnetic properties of said magnet.

Thus, claims 15 and 16 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Hirozawa et al. ('048), Kaino et al. ('330), Kadokura et al. ('739), Nishiuchi et al. ('089), and Makita et al ('511).

### ***Response to Arguments***

5. Applicant's arguments filed 4/23/2007 have been fully considered but they are not persuasive.

Applicant argues that Kadokura does not disclose placing the substrate between oppositely-disposed targets in the tank and that the substrate faces the space extending between the opposing targets. The examiner agrees that Kadokura discloses placing the substrate in a position that faces the space extending between the opposing targets, however Kadokura also discloses that the substrate is placed beside the targets in order to achieve low temperature sputtering (Col. 10, lines 40-41). Thus, it would have been obvious for one of ordinary skill in the art to place a substrate that can withstand higher temperatures between the opposing targets in order to deposit material onto all sides of the substrate.

Applicant argues that neither Kadokura or Nishiuchi disclose inserting an electrode wire into the hole of the magnet. The examiner disagrees. The instant claims do not recite putting a charge on the electrode wire, so in the broadest interpretation of the instant claims, the electrode wire could be any wire on which the magnets are held as suggested by Nishiuchi (Fig. 6). Alternatively, one of ordinary skill in the art could

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interpret the electrode wire to be any wire capable of being charged. In this case, Nishiuchi describes that the holding members are formed of stainless steel (Col. 6, lines 48-49), which would suggest that the holding members in Fig. 6 would also be formed of stainless steel. Thus, it would have been obvious to one of ordinary skill in the art that the stainless steel holding members of Nishiuchi would be capable of being charged and would thus act as an electrode wire.

In response to applicant's argument that there is no suggestion to combine the Kadokura and Nishiuchi references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Kadokura and Nishiuchi describe methods to form a uniform coating on a substrate. It would have been obvious to combine both of these methods in order to form a uniform coating onto all sides of a substrate, such as the magnets of Hirozawa and Kaino.

### **Conclusion**

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Burkhart whose telephone number is (571) 272-6647. The examiner can normally be reached on Monday-Thursday, 7:00 AM-5:30 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a


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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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**TIMOTHY MEESKS**  
**SUPERVISORY PATENT EXAMINER**